

REMARKS

Claims 1 and 5 are amended. Claims 1-30 remain in the application.

The amendments to claim 1 are supported in the specification, for example in FIG. 4 and at paragraphs [0029] and [0030]. The amendment to claim 5 is supported in the specification in FIG. 1 and at paragraph [0019]. These amendments therefore do not constitute new matter.

Claims 1, 3, and 4 are rejected for obviousness over US 2002/0097752 A1 ("Jones") in view of US 5848061 ("Hasegawa"). This rejection is respectfully traversed for the following reasons.

Prima facie, rejection of a claim for obviousness over a combination of references requires some motivation to combine the references, a reasonable expectation of success, and the inclusion of all elements (or steps) of the rejected claim in the combination. See MPEP 2143 et seq.

Claim 1, as amended, is directed to a distributed data frame structure for the transmission of data frames over N channels, in which each data frame is represented by L bytes. The distributed data frame structure includes N subframe structures, each corresponding to one of said channels, in which:

"the L bytes representing each data frame being rotatably deinterleaved into successive groups of bytes distributed to said subframe structures;

the rotation of deinterleaving for each data frame beginning at a subframe structure different from the subframe structure at which the rotation of deinterleaving began for the previous data frame; and,

a frame alignment signal comprising a pattern of bits, said frame alignment signal occurring every L bytes in each of said subframe structures."

Neither Jones nor Hasegawa teaches or suggests rotatably deinterleaving a data frame into successive groups of bytes distributed to said subframe structures, each of which corresponds to one of a number of channels, wherein "the rotation of deinterleaving for each data frame beginning at a subframe structure different from the subframe structure at which the rotation of deinterleaving began for the previous data frame". Jones teaches frame construction, not frame deconstruction, while Hasegawa uses a frame pulse signal extracted from a data frame to operate a de-multiplexer.

Accordingly, the combination of Jones and Hasegawa does not include "all elements" of the rejected claims and fails to meet the third requirement of *prima facie* obviousness, and the rejection of claims 1, 3, and 4 should be withdrawn.

Claims 2 and 5 are rejected for obviousness over Jones and Hasegawa, further in view of US 6931009 B1 ("Agrawal"). This rejection is respectfully traversed for the following reasons. Claims 2 and 5 depend from claim 1 and are distinguishable from Jones and Hasegawa for the reasons given above. In addition, Agrawal does not teach or suggest deinterleaving a data frame into successive groups of bytes by rotating the distribution of the successive groups of bytes to subframe structures, each of which corresponds to one of a number of channels, wherein "the rotation of deinterleaving for each data frame beginning at a subframe structure different from the subframe structure at which the rotation of deinterleaving began for the previous data frame". Agrawal teaches assembly of data for transmission by interleaving individual frames to produce an interleaved frame. At col. 6, lines 39-42, Agrawal describes a deinterleaver 130 that de-interleaves a received interleaved frame "to provide a group of individual frames". But, Agrawal's description of the deinterleaver 130 does not include any element or function to rotatably deinterleave frames of the interleaved frame into successive groups of bytes distributed to "subframe structures" that correspond to channels. In this regard compare the rotatable distribution of the bytes of a frame across the four subframe structures shown in FIG. 4 of this application with FIGS. 6 and 7 of Agrawal which show the extraction of successive corresponding portions of an array of frames.

Accordingly, the combination of Jones, Hasegawa and Agrawal does not include "all elements" of the rejected claims and fails to meet the third requirement of *prima facie* obviousness, and the rejection of claims 2 and 5 should be withdrawn.

Claim 6 is rejected for obviousness over Jones and Hasegawa, further in view of US 6795451 B1 ("Giorgetta"). Claim 6 depends from claim 1 which is patentably distinguishable from Jones and Hasegawa for the reasons given above. Giorgetta does not make up the deficiencies of Jones and Hasegawa with respect to claim 1 and therefore claim 6 is not obvious over Jones, Hasegawa and Giorgetta.

Claims 7-11, 13-16, 18-26, and 28-30 are rejected for obviousness over Jones in view of US 5940863 ("Fimoff"). This rejection is traversed for the following reasons.

Claims 7-11, 16, 18-22, 26, and 28-30. The contention in paragraph 19 of the Office Action is that Fimoff "teaches (col. 1) performing a rotating deinterleaving procedure on said plurality of data frames." The applicant respectfully disagrees. In fact, Fimoff at col. 1 only teaches that certain data groups that are interleaved and rotated in a data frame "must be de-rotated and de-interleaved".

In converting a frame by interleaving, Fimoff changes the structure of a frame of video data from row major ordering to column major ordering as shown in FIGS. 1 and 2, which interleaves the columns of the frame. Then, the elements of any column may be rotated within the column, as per segment 22 in FIG.2. Using Fimoff's terminology, this may be characterized as an "interleaving-followed-by-rotating procedure." In order to recover the original video frame, Fimoff must first de-rotate any rotated elements and then de-interleave by conversion back to row major order in what may be characterized as a "de-rotating-followed-by-de-interleaving procedure." Clearly, "rotation" and "de-rotation" according to Fimoff are performed independently of "interleaving" and "de-interleaving". Also, "rotation" according to Fimoff corresponds to disordering a canonical order, while de-rotation corresponds to restoring the canonical order; so "de-rotation" in Fimoff cannot be read as "rotation". Further, to the extent that there is association between the functions in Fimoff, "rotation" goes with "interleaving" not with "de-interleaving". This is contrasted with the sense of "rotating deinterleaving" in view of the specification of this application in which a canonical frame order is deinterleaved by (not before or after) rotation (not de-rotation).

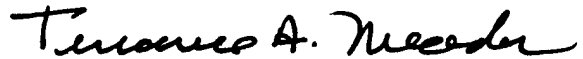
Claims 13-15 and 23-25. Claims 13 and 23 recite "a rotating deinterleaver" which, according to the implication at paragraph 25 of the Office Action, is described by the "rotating deinterleaving" in col. 1 of Fimoff. The applicant respectfully submits that, for reasons given above in respect of claims 7-11, 16, 18-22, 26, and 28-30, Fimoff does not describe "rotating deinterleaving". Further, Fimoff's de-rotating function is performed by "de-rotating means" that de-rotates the rotated and interleaved data to produce de-rotated and interleaved data, while de-interleaving the de-rotated and interleaved data is a separate function separately performed by a separate de-interleaving means. See Fimoff at col. 1, lines 50-57. Even reading Fimoff more broadly than is permitted, there is, at best, a "de-rotating and deinterleaving means", but there is no "rotating deinterleaver" that is "configured to reformat said data frames into a plurality of subframe structures, each corresponding to one of a plurality of different transmission channels" (claim 13) or that is "configured to distribute data from said plurality of subframe structures into a data frame" (claim 23).

Accordingly, the combination of Jones and Fimoff does not include "all elements" of the rejected claims and fails to meet the third requirement of *prima facie* obviousness, and the rejection of claims 7-11, 13-16, 18-26, and 28-30 should be withdrawn.

Claims 12, 17, and 27 are rejected for obviousness over Jones, Fimoff, and Agrawal. This rejection is traversed for the reasons given above in support of claims 7-11, 13-16, 18-26, and 28-30.

In view of these remarks, it is submitted that all of the claims now in this application are patentably distinguishable from the references of record, early notice of which is earnestly solicited.

Respectfully submitted,



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